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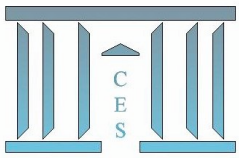

Do sporty people have access to higher job quality ?

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Do sporty people have access to higher job quality?

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Abstract

It is known that non-cognitive skills are an important determinant of success in life. However, their returns are not simple to measure and, as a result, only relatively few studies have dealt with this empirical question on the labour market. We consider sports practice as a way to improve or signal non-cognitive skills endowment. Therefore, the analysis of its impact on the labour market integration allows us to evaluate the returns of some specific non-cognitive skills. We test the hypothesis that sporty people –ceteris paribus- have access to higher quality of job thanks to the non-cognitive skills they have or they are supposed to have. Using objective measures of job quality, we demonstrate that being sporty does matter and that its effect cannot be award to any other extracurricular activities.

Keywords: Job quality, Sport, Non-cognitive skills

JEL Classification Numbers: J24/J28, L83, I2

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I. Introduction

In their study on the GED Testing Program[1], Heckman and Rubinstein (2001) demonstrate the importance on non-cognitive skills on life success and come to three conclusions. First of all, the traditional evaluations of the education efficiency are only based on measures of cognitive skills whereas they prove that success in education is closely related to individual's endowment in non-cognitive skills (such as self-discipline and motivation). They also conclude that if cognitive skills have to be acquired in the early stages of life, non-cognitive skills can be learned over a longer period of time even after the usual period of studies. At last, they point out the fact that the GED send out a mixed signal that they are not able to precise in terms of specific non-cognitive skills.

An explanation of the lack of interest in non-cognitive skills returns is the difficulty to measure it. If cognitive skills are estimated via educational level and diploma, there is no objective measure of non-cognitive skills. Furthermore, since they can be learned even after the traditional educational period, there is no ideal moment to measure it. At last, a lot of individual's characteristics are considered as non-cognitive skills which complicates the measure: tenacity and perseverance but also motivation, trustworthiness and self-discipline among others.

There is no specific class which fosters the non-cognitive skills formation but extracurricular activities are commonly considered as such. Our aim is to demonstrate how an extracurricular activity can favour –through individuals' non-cognitive skills endowment- life success. Our analysis is focused on one component of life success: individuals' position on the labour market. We choose sports participation as our extracurricular activity for three reasons. On one hand, sports can be practiced almost all along individuals' life which allows taking into account the fact that non-cognitive skills can be acquired during a very long period. On the other hand, by choosing a specific extracurricular activity we reduce the number of non-cognitive skills associated. At last, sports participation does not require any specific skills (unlike artistic activities for example) and it is relatively accessible[2].

[1] The General Educational Development testing program is "a second-chance program that administers a battery of cognitive tests to self-selected high-school dropouts to determine whether or not they are the academic equivalents of high-school graduates".

[2] If the infrastructures are available

De facto, the impact of sports practice on the labour market has received significant recognition in the United States (Barron J. et al 2000, Ewing B. 1998) for decades. Further, sports practice is a part of the educational system. Conversely, in Europe, sports participation is an extracurricular activity often considered as an obstacle to educational success. However, it begins to be recognized in the European business world. Firms seem to appreciate applicants with sporting activities and they organize seminars led by former athletes. As an example, we can find in management team former athletes that have good capacities in communication. Furthermore, a common advice when writing a CV, is to include two sports (an individual sport and a team sport) in the "personal interest" section. The scarcity of academic studies analysing this topic by using European data leads us to explore this topic.

Non-cognitive skills affect individual's position and evolution on the labour market at several levels (career evolution, wage, level of responsibility, type of work, etc.). We decided to centre our analysis on labour market integration and more particularly on job quality of people who came back to work after a period on unemployment. Our hypothesis is that sporty people get higher quality job. This assumption relies on firms' and individuals' behaviours. On one hand, we assume that firms believe that sporty people are persistent, responsible, independent, etc. This assumption relies on the signalling effect (Spence 1973). Then, employers are able to value a part of the non-cognitive skills during the hiring interview. On the other hand, we consider that sporty people have been more unremitting as they were looking for a job. The way they search a job and how they behave during the interviews is determinant. They also have better connections on the labour market (networking effect).

However, sports practice is not sufficient by itself to favour the labour market integration. Being sporty and unemployed does not necessarily send a positive signal; thereby the influence of sports participation is positive only under specific conditions. We expect different effects with respect to the level of education, the age and the gender, but also with respect to individuals' health and wealth. This means that we have to control for all the individuals' characteristics which affect sports participation and labour market integration. In addition, we want to make sure that the effect of sports participation cannot be granted to any other leisure activity.

We studied two aspects of job quality which are related: the hourly wage and the level of autonomy at work. We found a robust positive impact of sports participation on the wage

level. And being sporty and having the high school level are complementary. With respect to the level of autonomy, the relation is weaker and more difficult to precise. However, the two estimations cannot be compared because they do not reflect the same level of job quality.

This article focuses on the influence of being sporty on the quality of the job hold after a break in working activity in Germany. In section II, we review the literature before posing our problem and presenting our econometrics procedure (section III). The data are presented in section IV. The results are reported in section V, and then we conclude in the sixth section.

II. Theoretical Background

Cognitive and non-cognitive skills

Becker (1964) essentially measures human capital by using indicators of the level of education. Spence (1974) developed a concept which allows the use of education in order to signal unobservable ability but again it is about cognitive skills. The wage equation of Mincer only considers returns of education (and traditional labour market indicators) to explain the wages level. Therefore almost all the studies on human capital and labour market are focused on cognitive skills. But as underlined by Heckman (2000), non-cognitive skills are necessary even for the learning process of cognitive skills.

Jacob (2002) explains the gender difference in returns to college by demonstrating that women have greater non-cognitive skills than men. He builds four measures of non-cognitive skills based on student behaviours at school. Two of these rely on disciplinary incidents, on retention in grade (during elementary school) and the two others measure effort and achievement in school. For each of these indicators, women score higher than men. In a similar way, one cannot expect the same impact of sports practice on men and women. First of all, firms/we credit men and women with specific soft-skills: women are supposed to be consensual when men are supposed to have more competitive spirit, for example.

Non-cognitive skills can be learned through a lot of ways: family or peer education, participation to an extracurricular activity, cultural heritage. Furthermore, this apprenticeship is informal in most cases because there is no evaluation of people's non-cognitive skills endowment. Therefore people tend to improve non-cognitive skills they already have. For

instance if a person has a great ability for team work, she will enjoy doing team sports. But a person who likes competition can decide to join a volley-ball club and *there* learning team spirit. This means that the specific endowment in non-cognitive skills owned by sporty people does not necessarily result from sports practice. Also the positive impact of being sporty on the labour market can be explained by at least two different mechanisms: the signalling effect and the "human capital effect" (increase of the human capital).

Positive impact of sports participation

American studies

Most of the American studies analyse the impact of sports participation in cross section framework. They have access to very detailed databases (NCAA, HBS, NELS, and NLSY[3]) with accurate information even on sports practice. The most recent studies underline the positive effect of sports participation while in school (at the university) on graduation and on wages (higher for sporty people from 4 to 32%). There is no study on sports participation and labour market integration.

Long and Caudill (1991) found a strong positive effect for sporty people on graduation for men and women and higher wages for men but they only take into account athletes with good performance. They explain their results leaning on the signalling effect, the reputation effect and the effect due to the increase of the human capital. The signalling effect (Spence 1973) is based on the idea that some observable characteristics are used as signal to select people who have some unobservable specific characteristics. Then sports practice enhances the acquisition of non-cognitive skills/soft-skills (leadership, performing in a regulated system, etc.) and this way increases workers' productivity (by increasing the human capital). And at last the reputation effect which depends on the public image of the athlete. A firm would hire a former athlete because of the image of the company he can give (Z. Zidane for Danone, T. Woods for Nike).

Ewing (1998) showed that sporty people earn more. It is justified by three facts: sporty people hold jobs where the wage highly depends on their productivity, and where they lead people (job with responsibilities). And lastly, they are often union members. These statements confirm the idea that sporty people behave differently. However we do not know in which is the sense of the causality. Do they behave differently because they did sports at the university

3 National Collegiate Athletics Association, High School and Beyond, National Education Longitudinal Survey, National Longitudinal Surveys of Youth

and they learned something from that experience? Or did they practice sports because they were already different at the university as they still are today?

Barron, Ewing and Waddell (2000) argue that sporty people hold positions where they are paid comparatively to their productivity. Since sporty people are competitive and persistent, they choose this type of jobs and hence they earn more. The authors maintain that sports practice is not equivalent but better than any other extracurricular activity.

Anderson (2001) points out the divergence of the impact of sports practice on the minorities. She notices a negative influence on minorities due to an over investment in sports education (being an athlete would guarantee an upward social mobility) and therefore an under investment in studies.

European studies

There are few European studies on the effect of sports practice: two are on labour market effect and two others on education.

Cornelißen and Pfeifer (2007) measure the impact of sports practice on graduation, using the German Socio Economic Panel (SOEP). Sporty students seem to improve their productivity at school by being healthier, by having soft skills (and character) appreciated as qualities at school, etc. They underline a larger effect for the girls and justify it pointing out their original difference. Girls are by nature less aggressive and therefore they have more to learn about competition than boys.

There is a study done by Eber (2006) in experimental economics which focuses on students –with different sports practice- behaviours. Eber conducted his own survey (and database) comparing sports science students (STAPS) to others students. He finds out that the two groups are different and that, into the group, studying sports science girls and boys answered differently. Girls look more for equality and boys look more for competition. Eber does not control for the type of sports people practice. A priori girls and boys do not choose the same sports and this difference in their preferences at the beginning can be enhanced by the sports they practice. One expects that men prefer team sports and women tend to practice more individual sports. Furthermore, independently to their preferences, sports supply differs by gender which means even if they have the same preferences, the distribution of men and women by type of sports would not be equal. Therefore men and women do not practice the same sport and their "original" differences in terms of characteristics can be enhanced by the sports they practice. In his study, Eber demonstrate that sporty people are different and how

different they are. However he cannot infer the sense of causality. Obviously the influence goes both ways but the question is in which extent?

The two articles which deal with sports participation returns on the labour market were published recently. In his article Lechner (2009) analyses the returns on the German labour market in terms of earnings and wages. He defines three channels. First of all, people who practice sports are healthier and, as a consequence they are more productive and less absent. Secondly, firms suppose that sporty people are more motivated and in a sense happier which would increase their productivity. And at last, sporty people can have the same unobservable characteristics as people who earn more; this is the auto-selection process. He calculates that being sporty comes to an additional year of schooling in terms of returns on labour market long-term outcomes.

Rooth (2010) made a double analysis in order to value the impact of practicing leisure sports on labour market outcomes in Sweden. A part of his study relies on experimental economics and the hiring process. People who declare practicing sports (as leisure) in their CV have a higher probability to get an interview. He compares this impact to 1.5 additional years of work experience. This part of his paper clearly demonstrates the existence of a positive signalling effect for sporty people. He also estimates the impact of a variation of the physical fitness on earnings and finds a positive effect (4%). Unlike the previous impact, this one is less easy to grant to a specific effect.

As a conclusion, even in Europe –i.e. even in countries where sports practice is considered an extracurricular activity, a leisure activity- sporty people are relatively more successful on the labour market than non sporty people.

Determinants of sports participation

The decision to practice sports has been often investigated. There are traditionally 3 sets of explicative variables for the sports participation: individual determinants (gender, age, marital status, number of children and health), social determinants (ethnicity and education) and economic determinants (income, worked hours, employment status). The studies highlight a positive impact of the amount of the income and the level of education on the sports practice. Conversely the number of worked hours and the age of the individual have a negative effect. Then according to the authors, indicators about the region (P. Downward

2007), about others type of leisure (P. Downward 2007) and variables of interaction (Farrel & Shields 2002) are also included in the estimations.

Humphreys and Ruseski (2009) made a double analysis: they observed people who practice sports and how long they practice it. An increase of the income raises the probability of practicing sports (but has no large effect on the time spent practicing sports). They find a large and positive impact of the level of education on the time spent in physical activities. They assign this effect to the income effect: people who have a high educational level tend to earn more money than people with a lower educational level. Therefore people with higher educational level also have a higher opportunity cost of time. However they spend more time doing sports which means the income effect is higher than the substitution effect (when the opportunity cost of time increases). Also sports practice is highly and not simply related to individuals' economic conditions.

This means that on one hand, we have to control for all the individuals' characteristics affecting sports participation and labour market integration. Healthy people, for example, are more able to practice sport and to have standard job whereas unhealthy people tend to be non sporty and to get low quality job. Individual health is a part of human capital (which determines individual productivity) so being healthy is an advantage for being hired. The story is the same if we consider wealthy people: they have more money to spend in sports practice and they have a better access to higher quality job (because of their social position and network or thanks to the academic education they received for example).

Job quality

As underlined by Clark (2005), job quality cannot only be defined as incomes' level per hour. It also depends on the level of autonomy, on the future prospects, on the stress and on the interpersonal relationships. Therefore, we decide to focus on two objective measures of job quality and we choose the level of autonomy and the hourly wage.

III. Problem and formalised approach

Since we are interested in the impact of sports participation on the labour market integration through the non-cognitive skills' channel, we have to control for two channels:

health and reputation[4]. According to the literature, there are three remaining effects: the signalling effect (Spence 1973), the effect of increasing human capital and the networking effect.

The signalling effect (Spence 1973) is based on the idea that some observable characteristics are used as signal to select people who have some unobservable specific characteristic. For our analysis, we choose to compare –with respects to their sports participation- jobs' quality of people who "have started up with paid employment again after not having been employed for a while"[5]. Thereby signals sent out are interpreted in a very specific way.

A period of unpaid activity leads to a destruction of human capital which means a loss of individual productivity. However, one can expect that someone who did sport meanwhile, suffers less from this phenomenon than an "inactive person" in two different ways. First of all, these people have been physically active so they are supposed to be healthier, which may increase their productivity at work and they should be less absent. Secondly, if they practiced sports, they did it instead of another activity which means they have a lower preference for other leisure (sleeping, hanging around, partying, etc).

Furthermore, someone who is sporty whereas he is not employed will be seen as someone who does not give up, which is a very attractive quality for firms (tenacity, perseverance).

At last, if we consider that sporty people do sports because it is easy for them, it implies that they have already the soft-skills and qualities that they need to do so (in addition to the fact that they are healthy). For example, someone who has a great team spirit would like to take part in some team sport. Thus, firms who want people with good team-spirit (or any other soft-skill which improve the productivity) hire people who do or who have done team sports. In this case firms make a sizeable assumption about the transferability of these soft-skills: they expect that sporty people will behave in the professional area as they do in the sports area.

[4] The reputation effect is more common in the United States of America because it depends on the public image of the athlete.

[5] This is the expression as they use it during the survey.

The second reason which could justify the fact that sporty people get higher quality job is the networking effect. By practicing sports they keep in contact with people who are working.

The third reason why sporty people are getting higher quality job is because they are more persistent. As we mention above (with respect to the signalling effect), sporty people are assumed to have a competitive spirit, not to give up easily, to try everything to win, etc. Therefore, besides sending out a positive signal of these qualities, some of them actually have these qualities. In this case, finding a high quality job is a result of effort and persistence (among others things).

We are not able to determine precisely which effect is playing. However, we can state how sports practice impact on the quality of the job people have after having been "unemployed" for a while. We assume that job quality can be determine by a set of individuals' traditional characteristics $X_{i,j}$. We take into account the past situation of each individual on the labour market (worked experience, unemployment and past household income) as well as the global situation on the labour market (year, region). $X_{i,j}$ also contains the level of education of the individual, as well as his nationality, his age and his family situation (married, number of children). We expect all these variables to have the same impact as usual. In addition, we introduce our variable of interest: $\mathbf{sporty_i}$. We assume that being sporty has a positive impact on the job quality people find, hence δ_1 is positive.

$$\text{Job Quality}_i = \Phi (\mathbf{sporty_i} , X_{i,j})$$

$$\text{Job Quality}_i = \delta_0 + \delta_1 \mathbf{sporty_i} + \delta_j X_{i,j} + \varepsilon_i$$

As we already explained we do not consider that being sporty is an advantage regardless the individuals other characteristics. If we compare two individuals having exactly the same characteristics except for their sport activity, the sporty one has an advantage on the labour market. However, we do not know if for a different level of education, being sporty has the same impact. The question would be the same with respect to different levels of health, of income but also with respect to the gender. Therefore we use interaction terms in order to refine our relationship. We also add specific variables in order to control as much as possible

for individuals characteristics which impact being sporty *and* having a high job quality. Then, as we focus our analysis on sports practice we have to be sure that only sports participation impacts labour market integration. We check the robustness of our estimations by adding others extracurricular activities.

IV. Data

We use the German Socio Economic Panel Data (GSOEP[6]) which is a « representative longitudinal study of private households in the entire Federal Republic of Germany »[7] from 1984 until now. One can follow the individuals during 24 years but we choose to work on the period 1991-2007 in order to have people from whole Germany. All the considerations below concern our sample which includes only people who "have started up with paid employment again after not having been employed for a while". We also restrict our sample to people who are between 16 and 55 years old.

Variable of interest: sports participation

Concerning the sports practice, there is only one question in the GSOEP which is available for the whole sample:

> *Which of the following activities do you take part in during your free time? Please check off how often you do each activity: at least once a week, at least once a month, less often, never.*
>
> *- Doing sports yourself*

We construct a dummy (*sporty*)[8] which corresponds to "practicing sports at least once a week" because we consider this answer as the only one qualifying sporty people. According to our definition of a sporty person, almost one third of our sample is sporty with a higher proportion among the youngest.

6 The data used in the presentation were extracted using the Add-On package PanelWhiz v2.0 (Nov 2007) for Stata. PanelWhiz was written by Dr. John P. Haisken-DeNew (john@panelwhiz.eu). The PanelWhiz generated DO file to retrieve the SOEP data used here and any Panelwhiz Plugins are available upon request. Any data or computational errors in this paper are my own. Haisken-DeNew and Hahn (2006) describe PanelWhiz in detail.

7 http://www.diw.de/english/soep/soepoverview/27908.html

8 Descriptive statistics for all the variables we use are presented in the Table 1.1 in the Appendix.

A statistical analysis by gender reveals very different sports behaviours for men and women. On average, men are sportier than women (31% versus 26% respectively) but each group has its own evolution with respect to individuals' age. Young men are sportier than young women (46% versus 22% respectively) but when people get older women are sportier (33% versus 23% respectively). Women sports participation increases with the age whereas men sports participation is decreasing. Obviously men and women motivations to practice sports are not the same thus we differentiate sports participation by gender. We explain men sports participation by considering that they consider sports as leisure (i.e. as a way to relax). Therefore, they enjoy practicing sports which require high levels of physical capacities. As they get older their physical condition decreases and sometimes they also get more responsibilities (which means less time) also they give up on sports. As an example, young men like to play football or basketball, sports that they do not appreciate in the same way when they are over thirty[9]. Conversely, as women get older, they tend to practice more sports in spite of their physical capacity decreasing with age. We conclude that women choose[10] sports which help to maintain their physical condition or which help to get back in shape (fitness for example).

Sports practice enables to stay healthy, improving individuals' productivity, however we are interested in another channel: non-cognitive skills' channel. Therefore we should not retain people who are practicing sports in order to keep in shape. There is no information of the type of sports people practice in the SOEP Data but our statistical analysis lead us to consider that we can characterize the type of sports by gender. This is why we restrict our sample to men only.

Dependant variables: job quality

As mentioned above we consider only people who "have started up with paid employment again after not having been employed for a while". The exclusion of women allows us to lay aside the specificity of their career path (pregnancy, motherhood)[11]. Our sample is constituted by men –coming from anywhere in Germany- who are between 16 and 55 years old –between 1991 and 2007- and who are working again since less than a year.

We evaluate the impact of sports participation on the job quality with two indicators: the level of autonomy and the wage.

[9] Because of a lack of time and physical condition
[10] Or as we already mentioned "have to choose" because the supply is limited.
[11] Their labour market re-integration cannot be compared to men's re-integration due to the reason of their leave (due to the legislation)

An objective measure of the level of autonomy is available in the GSOEP. It has been constructed by using accurate information about individuals' working position. It is an ordered discrete variable from 0 to 5, 0 being associated to apprentice. According to our research question, we decide to not take into account apprentice also in our sample people have a level of autonomy set between 1 and 5. The distribution of the sample into these five levels is not well-balanced: more than 80% of the whole sample has a level of autonomy equal to two[12] also we aggregate the five levels in two categories. The dummy variable we obtain is equal to zero if the level of autonomy is lower than two and equal to one if the level of autonomy is higher (equal to 3, 4 or 5). This means that we estimate the probability of having a really high level of job quality. We already observe a difference between the whole sample and the sporty one: sporty people are almost twice more represented at higher levels of autonomy than the others.

The other job quality indicator we use is the wage people received from their main job. Since we have information on the number of month and working hours people work per week thus we are able to calculate the hourly wage of each individual. We use the logarithm of this variable as dependant variable. Therefore, we can estimate a continuous variable, in opposition with our first job quality indicator (the variable of autonomy). We find a positive correlation of 0.32 (significant at a level of 1%) between sport practice frequency and the dependant variable of wage.

The two variables we construct to measure job quality are –as expected- statistically positively linked to sports participation.

Independent variables

We use a set of variables which are traditionally used in the wage equation of Mincer: individuals' characteristics, indicators of the level of education and information about their situation on the labour market.

As individuals' characteristics we retain the age, the nationality, the marital status, the number of children and the region of living. The age is a discrete variable (from 17 to 55) named *age* in our tables. For the nationality we choose to construct a dummy (*german*) which is equal to one if the individual is German and equal to zero otherwise. The marital status is

[12] This is perfectly normal considering that we only have people who came back to work since less than a year.

also a dummy variable (*married*) equal to one if people are married and equal to zero otherwise. We choose to take into account only the number of children who are living in the household and who are less than 15 years old. The variable *nb children* is a discrete variable. At last, we include an information (*west*) with respect to the region where people are living. We have to differentiate former East-German from former West-German because their socioeconomic situations were really different in the 90's and these differences are partly remaining nowadays. As we mentioned above, individual's socioeconomic characteristics does matter on labour market integration as well as on the decision to practice sport or not. Furthermore, the socialist were pro-professional sport but they did not focus on sports for everyone. Therefore, the availability of sports infrastructure is better in the "west" than in the "east". The variable is a dummy equal to one if people are living in the former West-Germany and equal to zero otherwise. One third of the people who are living in the former West-Germany are sporty when the proportion is one to four in the former East-Germany. And the difference with respect to the quality of job people hold in t goes the same way: 27% of the people who are living in the former West-Germany have a high level of autonomy at work versus less than 20% (for people who are living in the former East-Germany).

The indicator of the level of education we choose is based on the high school level. It is a discrete variable equal to one if the individual has less than the high school level, equal to two if the individual has exactly the high school level and equal to three if he has more than the high school level. Instead of using this discrete variable, we construct three dummies (one for each level), so as to ease the interpretation. In our sample, sporty people are overrepresented at the highest level of education. The ratio of sporty people in the whole sample is one to three but it reaches almost one to two for people who have more than the high school level. This result complies with the theoretical framework.

People position on the labour market is characterised by the work experience as well as the unemployment experience (discrete variables). For the work experience (*exp*), we summed the full-time work experience and the part-time work experience.

People for whom t-1 was the first experience of unemployment have a higher probability to get higher job quality in t than people who were already unemployed several times. In order to control for the individuals' history on the labour market, we introduce the variable *exp unemployment*. This is a discrete variable which is the sum of the years passed as unemployed.

To capture other parameters which could favour the access to job of higher quality, we include the logarithm of the netto income the household earned in t-1. This variable is a proxy of individuals' access to network and position on the labour market and in the society.

As mentioned in the literature review, the socioeconomic situation of the individuals has a relevant impact on their sports participation as well as on their labour market integration. Since we are looking for an impact of sports practice through the possession of non-cognitive skills (innate or acquired), we filter out every other channel. We already have a variable which reflect the level of education, and the variable *household income* allows to controle for the income effect[13] and a part of the networking effect too. As we already know, health being an important factor, we add a variable on people health (*health status*). This is a discrete variable equal to 1 if people consider themselves healthy and equal to 5 if they consider themselves unhealthy.

V. Results

Our objective is to measure how being sporty impacts people's job quality when they were "unemployed" for a while. We use two correlated measures of the job quality (0.57 significant at a level of 1%): the level of autonomy and the level of wage. This double estimation allows more precise and robust conclusions for at least two reasons. First of all they do not measure exactly the same thing. The level of autonomy is 0 for 80% of our sample which means that we estimate the probability of being one among the 20% remaining. Conversely, everyone has his own level of wage and there is no barrier between people. Then, the variable of autonomy is a dummy and the variable of wage is continuous. Therefore; also it allows two different specifications, meaning that we are more flexible on our hypothesis linking sports practice to job quality.

The level of autonomy is a dummy variable. Accordingly we have to use a probit model.

$$\text{autonomy}_{i,t} = \alpha_0 + \alpha_{13}\,\mathbf{sporty_{i,t-1}} + \alpha_1\,\text{age}_{i,t} + \alpha_2\,\text{german}_{i,t} + \alpha_3\,\text{west}_{i,t} + \alpha_4\,\text{married}_{i,t-1} + \alpha_5\,\text{nb\_children}_{i,t-1} + \alpha_6\,\text{educ}_{i,t} + \alpha_7\,\text{exp}_{i,t} + \alpha_8\,\text{exp}^2_{i,t}$$

[13] Wealthier people have a better access to extracurricular activities such as sports.

$$+ \alpha_9 \, \text{exp\_unemployment}_{i,\,t} + \alpha_{10} \, \text{household\_income}_{i,\,t-1} + \alpha_{11} \, \text{year}_t + \alpha_{12} \, \text{health}_{i,\,t-1} + \varepsilon_{i,\,t}$$

We use the logarithmic form for the hourly wage and run a simple OLS.

$$w_{i,\,t} = \beta_0 + \beta_{13} \, \mathbf{sporty_{i,\,t-1}} + \beta_1 \, \text{age}_{i,\,t} + \beta_2 \, \text{german}_{i,\,t} + \beta_3 \, \text{west}_{i,\,t} + \beta_4 \, \text{married}_{i,\,t-1} + \beta_5 \, \text{nb\_children}_{i,\,t-1} + \beta_6 \, \text{educ}_{i,\,t} + \beta_7 \, \text{exp}_{i,\,t} + \beta_8 \, \text{exp}^2_{i,\,t} + \beta_9 \, \text{exp\_unemployment}_{i,\,t} + \beta_{10} \, \text{household\_income}_{i,\,t-1} + \beta_{11} \, \text{year}_t + \beta_{12} \, \text{health}_{i,\,t-1} + \mu_{i,\,t}$$

First of all we estimate each of our dependant variables without any indication of sports participation. This way we test the accuracy of the variable we choose in order to explain job quality. Our outcome is an indicator of the job quality people who "have started up with paid employment again after not having been employed for a while" have in t. This means that firms have chosen to hire them in t-1. Therefore, some of the individuals' characteristics used in the estimation are the one people had in t-1. Indeed we report the health status, the marital status, the household level of income, the number of children and the sports participation people have in t-1. The characteristics which automatically increase for a year every year (such as age) and characteristics which are stable (such as education in our sample) are the one people have in t. The results[14] appear in the Table 2.1[15] and 2.2[16], next to the results of the estimation once sports participation (*sporty*) has been added. Both of the two estimations have a great power of explanation of the job quality. The traditional variables have the expected impact when they are significant. And the most important effect is due to the same two variables: *west* and *education: more than high school*. People substantially increase their chance to get a high quality job[17] if they have a level of education higher than the high school level and if they live in the former West-Germany. However we are already able to confirm that the two job quality indicators do not exactly reflect the same idea. Wage variations are closely related to labour market indicators whereas the level of autonomy depends widely on individuals' characteristics. Others variables do matter but in a quite smaller proportion.

[14] The statistical and econometric work has been done by using STATA and PanelWhiz.
[15] Each estimation contain a dummy for each year in order to control for the economic conjuncture but it does not appear in the Table of results for a concern of clarity
[16] The coefficients which appear for the probit estimation are the marginal effects.
[17] With respect to our criteria : hourly wage and level of autonomy at work

In a second step we add our indicator of sports participation *sporty* (columns 2W and 2A of the tables). To control for the impact of sports participation on job quality through the channel of the health, we add simultaneously an indicator of individuals' health status. In both estimations, the impact of the traditional variables is quite stable except with respect to the level of education. The education lost some of its importance which can be explained by the duality of the skills it used to represent before the addition of an extracurricular activity. And the probability of having a high level of autonomy at work is now independent from the household income. As expected, being sporty raises the hourly wage of 8.3% and increases the probability to have a higher quality job from 0.011. Being healthy also positively affect the job quality and in almost the same proportion than being sporty. The fact that both estimation have a higher power of explanation and that the variables *health* and *sporty* are significant and positive allows us to consider that sports practice does impact job quality even once we have controlled for the health channel.

As we already outlined, sports practice is not supposed to be an advantage whatever the individuals' characteristics are. The positive impact of being sporty should depend on the level of education. Firms would not grant non-cognitive skills to someone who cannot give proof of cognitive skills. We include a term of interaction between the level of education and the sports characteristics. The results are quite interesting: being sporty does not impact anymore as well as having a level of education equal to high school. However being sporty and having the high school level increases the hourly wage from 22%, these characteristics are complementary. This means that being sporty only matters for people who have the high school level; it does not impact at all for the others. With respect to the probability to have a high level of autonomy at work, the addition of the interaction term cancels any effect of being sporty. This result is quite coherent with our previous results because our estimation is: "which is the probability to find a job with a very high level of autonomy?". We found earlier that being sporty has an effect only for people who have a level of education equal to the high school level. People who have continued their studies do not need sports participation to get higher wages in our specific situation. And it happens that these people are the one who could reach positions with a high level of autonomy. Therefore, the most important characteristics people should have in order to get high job quality are the traditional ones. At that level and just after having been unemployed for a while, being sporty (as we defined it) is not relevant.

Signal influences hiring decisions when firms cannot base their judgment on individuals' work experience and productive value. Therefore we would expect a slighter effect of sports participation for people who have already 10 years of work experience than for people who have only one year of work experience. We introduce an interaction term between sports participation and years of work experience in order to test this hypothesis. The addition of this term does not change the previous results. The interaction term is not significant and being sporty only has a significant effect if the individual has exactly the high school level. There is no relation of synergy or substitution between being sporty and the number of years of work experience. The addition of an interaction terms between sports participation and health status is not relevant: the coefficient stay the same as well as if we add an interaction term between *age* and *sporty*. Also, older people who are sporty do not send any specific signal to the employers as we could expect.

At last, we demonstrate that the positive effect of sports participation does not result from the fact that people are participating to some extracurricular activity. The successive addition of others activities such as artistic activities, politic commitment or working as a volunteer in an association allows us to observe the robustness of our effect. We previously define each involvement as we defined sports involvement which means we consider only people who declare to take part in the activity at least once a week during the year before they found their job[18]. We observe (statistically) that people who are sporty tend to have more extracurricular activities than the others. Therefore their particularity could be that they get more involved that the others. This characteristic can be granted to a lot of others extracurricular activities also it is relevant here to precise why sporty people are preferred.

Results appear in the Table 2.3. The information about the participation of artistic activities is available only for three waves which explain the substantial reduction of the sample. But this activity does not have any impact on the hourly wage. This is also the case for people who are volunteer worker. This result is very surprising because we expected a high positive impact. It is well known that firms value personal commitment. However our individuals did not have any paid activities in t-1 also it can be that firms consider that volunteer work is too far from “paid work”. Participating in politics activities has a considerable negative impact. One explanation is that firms consider that political activist protest too much to have access to high quality job. With respect to the level of autonomy,

[18] The question is the same as the one about sports participation, we only have information on the frequency.

participating in an artistic activity increases the probability to have a high level of autonomy at work from 0.028. This impact is greater than the one obtained from being sporty but it does not cancel it. Practicing artistic activities is a plus. However as we already notice, the sample is twice smaller which moderate the interpretation. The other extracurricular activities do not have any significant effect on the level of autonomy.

VI. Conclusion

Our aim was to measure sports participation impact on the job quality of people who came back to work since less than a year. We found a positive effect on both of our job quality indicators after having controlled for individuals' health and wealth. Furthermore, the introduction of others extracurricular activities does not weaken our results. Therefore, we are able to say that the effect we found cannot be granted to any other extracurricular activity.

Our analysis is more accurate with respect to the impact on the hourly wage. Being sporty is relevant only for people who have completed high school (neither more, nor less) and these people need to be sporty in order to value their educational level. Sports participation and high school level are complementary. This means that people who have this specific level of education should be encouraged to practice sports in order to better integrate themselves on the labour market. Furthermore, due to their level of education, they probably will not benefit from a large career evolution. Therefore it is really important for them to integrate the labour market at the highest level they can.

The age, the health status or the work experience do not matter, there is no effect of synergy or of substitution.

As expected, practicing sports has a positive effect on the individuals' labour market integration because it is associated to non-cognitive skills. Our variable is defined only on the sports participation people had the year before their labour market re-integration

. This means that we are sure to catch the signalling effect in our results. However we cannot infer that everyone should be sporty because we do not know by which others mechanism the effect occurs. Part of the reason is that people behave differently thus we still have to

determine if they do it because of their sports practice or because there are different since the beginning. We do not solve the problem of self-selection. Being sporty and having non-cognitive skill is definitely positively related but we do not know precisely how.

We are already working on refining our analysis. It would be interesting to add a variable of the number of years individuals have been sporty in order to know if – to confirm that- perseverance in being sporty is rewarded. The level of education could be more detailed. There are a lot of different formations after high school thus we would make a difference between professional and non professional education, as well as the duration of the formation.

VI. Appendix

Table 1.1

Variable	Obs	Mean	Std. Dev.	Min	Max
wage	6 312	2.06754	.4590483	-.465925	4.778326
autonomy	6 823	0.2164737	0.411871	0	1
age	6 823	37.2666	9.810474	17	55
west	6 823	0.2386047	0.4262618	0	1
german	6 822	0.9413662	0.2349553	0	1
married	5 556	0.287977	0.4528611	0	1
nb children	5 593	0.6754872	0.8449134	0	5
educ_HS	6 753	2.108989	0.4843193	1	3
sporty	5 422	0.2760974	0.4471068	0	1
exp	6 784	13.32552	10.07519	0	37.2
exp²	6 784	279.0638	345.1539	0	1383.84
exp unemployment	6 784	1.075059	1.587119	0	20.3
household income	5 591	10.23373	0.5099638	4.339771	12.88173
health status	5 475	2.791416	0.8375326	1	5
year	6 823	2002.079	4.287573	1994	2007

Source: GSOEP author calculation

Table 1.2

Education	Freq.	Percent	Cum.
less than high school	464	6.87	6.87
high school	5 089	75.36	82.23
more than high school	12	17.77	100.00
Total	6 753	100.00	

Source: GSOEP author calculation

Table 1.3

Years	Freq.	Percent	Cum.
1994	93	1.36	1.36
1995	1 075	15.76	17.12
1996	95	1.39	18.51
1997	91	1.33	19.84
1998	137	2.01	21.85
1999	119	1.74	23.60
2000	1 146	16.80	40.39
2001	174	2.55	42.94
2002	158	2.32	45.26
2003	161	2.36	47.62
2004	1 124	16.47	64.09
2005	158	2.32	66.41
2006	1 141	16.72	83.13
2007	1 151	16.87	100.00
Total	6 823	100.00	

Source: GSOEP author calculation

Table 2.1

	hourly wage		
	(1)	**(2)**	**(3)**
age	-0.002	0.002	0.003
	(0.37)	(0.42)	(0.44)
West Germany	0.377	0.376	0.373
	(12.84)***	(11.87)***	(11.77)***
German	0.051	0.061	0.055
	(1.24)	(1.39)	(1.27)
married	0.086	0.094	0.096
	(2.59)***	(2.60)***	(2.67)***
Nb of children	-0.023	-0.022	-0.021
	(1.30)	(1.19)	(1.15)
education: high school	0.112	0.082	0.028
	(2.74)***	(1.92)*	(0.55)
education: more than high school	0.378	0.325	0.274
	(5.55)***	(4.42)***	(2.75)***
exp	0.027	0.028	0.027
	(3.51)***	(3.30)***	(3.15)***
exp²	-0.001	-0.001	-0.001
	(4.09)***	(4.17)***	(4.00)***
exp unemployment	-0.015	-0.022	-0.024
	(1.69)*	(2.22)**	(2.43)**
household income	0.078	0.061	0.059
	(3.42)***	(2.37)**	(2.29)**
sporty		0.083	-0.103
		(2.67)***	(1.36)
health : bad		-0.034	-0.039
		(0.61)	(0.70)
health : good		0.064	0.054
		(1.84)*	(1.52)
sporty * high school			0.221
			(2.03)**
sporty * more than high school			0.207
			(1.46)
Constant	0.955	0.927	1.003
	(3.41)***	(2.94)***	(3.17)***
Observations	5 088	4 933	4 933
R-squared	0.38	0.41	0.41

Robust t statistics in parentheses, * significant at 10%; ** significant at 5%; *** significant at 1%

Table 2.2

	high level of autonomy		
	(A1)	**(A2)**	**(A3)**
age	0.004	0.003	0.003
	(4.15)***	(4.11)***	(4.10)***
West Germany	0.167	0.166	0.165
	(11.63)***	(11.31)***	(11.29)***
German	0.021	0.017	0.017
	(4.26)***	(4.12)***	(4.19)***
married	0.031	0.027	0.027
	(3.87)***	(3.56)***	(3.62)***
Nb of children	-0.011	-0.009	-0.009
	(3.12)***	(2.74)***	(2.72)***
education: high school	0.014	0.011	0.008
	(2.56)**	(2.22)**	(1.27)
education: more than high school	0.394	0.336	0.315
	(9.52)***	(8.38)***	(6.49)***
exp	-0.001	-0.000	-0.000
	(0.84)	(0.24)	(0.24)
exp²	-0.000	-0.000	-0.000
	(2.56)**	(2.70)***	(2.68)***
exp unemployment	-0.013	-0.012	-0.012
	(7.15)***	(6.75)***	(6.74)***
household income	0.011	0.007	0.007
	(2.35)**	(1.57)	(1.57)
sporty		0.011	-0.002
		(2.03)**	(0.14)
health : bad		0.001	0.001
		(0.13)	(0.11)
health : good		0.012	0.012
		(1.93)*	(1.86)*
sporty * high school			0.017
			(0.034)
sporty * more than high school			0.013
			(0.024)
Observations	5 498	5 288	5 288
Pseudo R-squared	0.47	0.49	0.49

Robust z statistics in parentheses, * significant at 10%; ** significant at 5%; *** significant at 1%

Table 2.3

	Hourly wage			Autonomy		
	art	**politics**	**volunteer**	**art**	**politics**	**volunteer**
age	-0.006	0.003	0.002	0.002	0.003	0.003
	(0.57)	(0.56)	(0.30)	(2.04)**	(4.04)***	(3.98)***
West Germany	0.326	0.373	0.373	0.087	0.163	0.162
	(6.42)***	(11.79)***	(11.04)***	(6.11)***	(11.18)***	(10.92)***
German	0.144	0.062	0.061	0.006	0.017	0.017
	(1.50)	(1.41)	(1.37)	(0.91)	(4.11)***	(4.00)***
married	0.071	0.100	0.099	0.040	0.027	0.027
	(1.14)	(2.77)***	(2.74)***	(3.29)***	(3.63)***	(3.64)***
Nb of children	-0.033	-0.023	-0.024	-0.015	-0.009	-0.009
	(1.03)	(1.25)	(1.24)	(3.79)***	(2.83)***	(2.79)***
education: high school	0.020	0.080	0.076	0.008	0.011	0.012
	(0.21)	(1.87)*	(1.76)*	(1.44)	(2.15)**	(2.45)**
education: more than high school	0.370	0.320	0.325	0.230	0.329	0.348
	(2.63)***	(4.32)***	(4.40)***	(4.46)***	(8.22)***	(8.49)***
exp	0.034	0.026	0.029	0.000	-0.000	-0.000
	(2.11)**	(3.15)***	(3.41)***	(0.33)	(0.17)	(0.07)
exp²	-0.001	-0.001	-0.001	-0.000	-0.000	-0.000
	(1.63)	(4.20)***	(4.28)***	(1.53)	(2.74)***	(2.77)***
exp unemployment	-0.019	-0.023	-0.022	-0.009	-0.011	-0.011
	(1.22)	(2.35)**	(2.20)**	(4.58)***	(6.67)***	(6.56)***
household income	0.084	0.062	0.059	-0.001	0.006	0.006
	(1.98)**	(2.39)**	(2.27)**	(0.23)	(1.49)	(1.47)
health : bad	0.075	-0.025	-0.035	0.002	0.000	0.002
	(0.63)	(0.45)	(0.62)	(0.17)	(0.03)	(0.16)
health : good	0.032	0.066	0.062	-0.003	0.012	0.012
	(0.55)	(1.89)*	(1.76)*	(0.56)	(1.89)*	(1.93)*
sporty	0.090	0.087	0.082	0.011	0.011	0.013
	(1.74)*	(2.80)***	(2.62)***	(1.86)*	(2.03)**	(2.19)**
artistic activity	0.008			0.028		
	(0.08)			(1.87)*		
political activity		-0.482			0.055	
		(2.90)***			(1.09)	
volunteer worker			0.009			-0.004
			(0.18)			(0.61)
Constant	0.809	0.907	0.761			
	(1.51)	(2.86)***	(2.45)**			
Observations	2 327	4 926	4 924	2 455	5 280	5 275
(pseudo) R-squared	0.37	0.41	0.41	0.54	0.49	0.49

Robust t-statistics in parentheses, * significant at 10%; ** significant at 5%; *** significant at 1%

Bibliography

Anderson D.J., (2001) ""If you let me play": the effects of participation in high school athletics on students' educational and analyse market success", Working Paper

Barron J., Ewing B., Waddell G. (2000), "The Effects of High School Athletic Participation on Education and Labor Market Outcomes", *Review of Economics and Statistics*, 82, pp. 409-421 and Statistics, 82, pp. 409-421

Breuer C. (2006), "Sportpartizipation in Deutschland – ein demo-ökonomisches Modell", DIW Discussion Papers No. 575

Brzinsky-Fay C. (2006), "Lost in Transition? Labour Market Entry Sequences of School Leavers in Europe", *European Sociological Review*, Vol. 23, Issue 4

Cornelißen T. and Pfeifer C., (2007), "The Impact of Participation in Sports on Educational Attainment: New Evidence from Germany", IZA DP No. 3160

Downward P. (2007), "Exploring the Economic Choice to Participate in Sport: Results from the 2002 General Household Survey", *International Review of Applied Economics*, Vol. 21, No. 5, pp; 633-653

Eber N. (2002), "La pratique sportive comme facteur de capital humain", *Revue juridique et économique du sport*, 65, pp. 55-68

Eide E.R. and Ronan N. (2001), "Is participation in high school athletics an investment or a consumption good? Evidence from high school and beyond.", *Economic of Education Review*, Vol. 20, No. 5, pp. 431-442

Evans W. N. and Schwab R. M. (1995), "Finishing High School and Starting College: Do Catholic Schools Make a Difference?", *The Quarterly Journal of Economics*, 110 (4), pp. 941-974

Ewing B. (1998), "Athletes and Work", *Economics Letters*, 59, pp. 113-117

Farrell L. and Shields M.A. (2002), “Investigating the economic and demographic determinants of sporting participation in England”, *Journal of Royal statistics society*, VOL.165, No.2, pp. 335-348

Greene W.H. (1998), “Gender Economics Courses in Liberal Arts Colleges: Further results”, *Journal of Economics Education*, pp. 291-300

Greene, Econometric Analysis, 5th Ediction (Prenctice-Hall, 2003)

Haisken-DeNew, John P. and Markus Hahn (2006) "PanelWhiz: A Flexible Modularized Stata Interface for Accessing Large Scale Panel Data Sets ", mimeo, http://www.panelwhiz.eu

Haisken-De New J.P. and Frick J.R. (2005) “Desktop companion to the German Socio-Economic Panel Study”, Berlin DIW

Heckman J.J. (1979), “Sample selection bias as a specification error”, *Econometrica*, Vol. 42, No. 4, pp. 153-161

Heckman J.J. (2000), “Policies to Foster Human Capital”, Research in Economics, Vol. 54, No. 1, pp. 3-56

Heckman J. J. and Rubinstein Y. (2001), “The Importance of Noncognitive Skills: Lessons from the GED Program”, *The American Economic Review*, Vol. 91, No. 2, pp. 145-149

Humphreys B. R. and Ruseski J. E., (2009), “The Economics of Participation and Time Spent in Physical Activity”, Working Paper

Jacob B. A. (2002) “Where the boys aren’t: non-cognitive skills, returns to school and the gender gap in higher education”, *Economics of Education Review*, Vol. 21, pp. 586-598

Kuhn P. and Weinberger C. (2004) “Leadership Skills and Wages”, Journal of Labor Economics, Vol. 23, No. 3, pp. 395-436.

Lechner M. (2009) “Long-run labour market and health effects of individual sports activities”, *Journal of Health Economics*, Vol. 28, No. 4, pp. 839-854

Long J., Caudill S. (1991), “The impact of Participation in Intercollegiate Athletics on Income and Graduation”, *Review of Economics and Statistics*, 73, pp. 525-531

Pawlowski T., Breuer C., Wicker P. & Poupaux S., (2009) “Travel time spending behavior in recreational sports - An econometric approach with management implications”, *European Sport Management Quarterly*, 9(3), in press.

Poupaux S. and Andreff W. (2006), “The Institutional Dimension of the Sport Economy in Transition Countries”, in T. Slack et M. Parent (eds.), *International Perspectives on the Management of Sport*, Elsevier

Poupaux S. and Breuer C. (2009) “Does higher sport supply lead to higher sport demand? A city level analysis”, Working Paper

Rooth D-O. (2010) “Work Out or Out of Work: The Labor Market Return to Physical Fitness and Leisure Sport Activities”, IZA DP No. 4684

Russel H. and O'Connell P. J. (2001) “Getting a Job in Europe: The Transition from Unemployment to Work among Young People in Nine European Countries”, *Employment & Society*, Vol. 15, No.1, pp. 1-24

Scheerder J., Vanreusel B., Taks M. (2005), “Leisure-Time Sport among Physical Education Students: a Time Trend Analysis of Sport Participation Styles”, *European Sport Management Quarterly*, Vol. 5, No. 4, pp. 415-441

Scherer S. (1999) “Early Career Patterns – A Comparison of Great Britain and West Germany”, Working Paper Mannheimer Zentrum für Europäische Sozialforschung

Skirbekk V. (2003) “Age and Individual Productivity: a Literature Survey”, Working Paper Max Plank Institute for Demographic Research